

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Hisense USA Corporation

Petitioner

v.

Brightplus Ventures LLC

Patent Owner

Case IPR2023-01401

U.S. Patent No. 8,941,331

PATENT OWNER'S SUR-REPLY

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USE OF EMPHASIS IN QUOTATIONS

All emphases in quotations and exhibit citations have been added, unless otherwise indicated.

APPLICABLE STATUTES

References to 35 U.S.C. §§ 102 and 103 are to the AIA versions applicable to the of U.S. Patent No. 8,941,331 (“the ’331 Patent”).

I. INTRODUCTION

Brightplus Ventures LLC (“Patent Owner” or “Brightplus”) submits this sur-reply showing that the grounds set forth by Hisense USA Corporation (“Petitioner” or “Hisense”) fail to render obvious challenged claims 17-25 of the ’331 Patent. Brightplus addresses these grounds below.

II. GROUND 1 – LYS AND GROOTES IN VIEW OF A POSITA FAILS TO RENDER OBVIOUS CLAIM 17.**A. A POSITA Would Not be Motivated to Combine Lys and Grootes**

Petitioner argues that “PO's arguments are legally incorrect because they rest on the assumption that obviousness requires that the prior art be physically combined.” (See, Paper 15 at 4). However, Patent Owner presented motivation to combine arguments (See below and Paper 12 at 12-17), which Petitioner did not respond to and are not directed to the physical combination of the prior art references, but the fact that Petitioner has not recited a proper motivation for why a POSITA would combine Grootes and Lys.

Petitioner fails to provide any “reason, suggestion, or motivation” as to why a POSITA would combine the references in the manner proposed. “An invention is not obvious simply because all of the claimed limitations were known in the prior art at the time of the invention. Instead, we ask ‘whether there is a reason, suggestion, or motivation in the prior art that would lead one of ordinary skill in the art to combine the references, and that would also suggest a reasonable likelihood of

success.’” *Forest Laboratories, LLC v. Sigmapharm Laboratories, LLC*, 918 F.3d 928, 934 (Fed. Cir. 2019), citing *Smiths Indus. Med. Sys., Inc. v. Vital Signs, Inc.*, 183 F.3d 1347, 1356 (Fed. Cir. 1999). Additionally, an expert must provide “meaningful explanation for why one of ordinary skill in the art would be motivated to combine these references at the time of this invention.” *Id.* at 1353–54.

The Board routinely denies obviousness grounds, when as here, a Petitioner does not provide any factual basis for its assertions. In *Kinetic Technologies, Inc. v. Skyworks Solutions, Inc.*, the Board found Petitioner’s motivation to combine arguments inadequate, as the Petition and expert declaration failed to “explain the ‘how,’ ‘what,’ and ‘why’ of the proposed combination of references.” IPR2014-00529, Paper 8, at 15 (Patent Tr. & App. Bd. 2014). More specifically, in *Kinetic*, the Board were not persuaded by the Petitioner’s assertions as the Petitioner did not explain how the references could be combined, how such a combination would yield a predictable result, or why the Person of Ordinary Skill in the Art would have combined elements from the two references in the specific manner of the claimed invention at issue in that case. *Id.* Hisense’ obviousness grounds suffer from the same deficiencies.

Petitioner offers only conclusory statements regarding motivation to combine the current supplies of Grootes with Lys. Petitioner contends that a POSITA would include a separate current source for each string of LEDs to improve the color and

brightness uniformity of the lighting system described in Lys. Petition, 19. Petitioner then contends that the current supply in Grootes balances the white point between three colors, which would improve the color and brightness uniformity of Lys. *Id.* Yet, Petitioner does not provide an explanation how the current supply in Grootes would address the issue of color and brightness uniformity in Lys. Both Lys and Grootes teach the same method of controlling LED brightness by utilizing a PWM control signal to drive a transistor; this method is referred to as on-off control, wherein the transistor is turned on and off according to the duty cycle of the PWM signal which causes the LED to change in perceived brightness. See Lys, 84:15-16, 77:9-16, and. 74:7-15; see also Grootes, ¶6, ¶41-42, ¶46, Fig. 2-3. No motivating factor exists as to why a POSITA would modify Lys to include the same circuitry (from Grootes) that Lys already describes; this would not address a deficiency of either reference. See *Intel Corp. v. Qualcomm Inc.*, 21 F.4th 784, 800 (Fed. Cir. 2021) (requiring a known element to address the known issue).

Additionally, there is no design need or market pressure motivating a POSITA to replace the on-off control of Lys with the on-off control of Grootes. Both references control LED brightness in the same manner, therefore the combination does not fit a design need or answer market pressure. Petitioner relied on improper hindsight to combine known elements in a that fit the Challenged Claims, rather than offering factual support for why a POSITA, when confronted with the problem of

color and brightness uniformity, would combine them in the manner claimed. *See In re Fritch*, 972 F.2d 1260, 1266 (Fed. Cir. 1992) (citing *In re Gorman*, 933 F.2d 982, 987 (Fed. Cir. 1991) (“It is impermissible to use the claimed invention as an instruction manual or ‘template’ to piece together the teachings of the prior art so that the claimed invention is rendered obvious”)).

Implementing the current sources of Grootes into Lys would undermine the key inventive feature of Lys and a POSITA would understand that the negative impact would have outweighed any motivation to combine. *Polaris Indus. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1061, 1067-69 (Fed. Cir. 2018) (vacating Board decision that failed to consider whether modifying prior art references would undermine its goal, shared with the challenged claims, of constructing stable all-terrain vehicles). Lys explained the key benefits of LED wavelength adjustment over typical stable color control, “[t]he light output from a semiconductor illuminator may shift in wavelength as a result [of] changes in current... [which has] been thought to be undesirable for most applications, since a stable color is often preferred to an unstable one...different wavelengths of light can be provided by changing the current supplied to the LEDs... to produce improved quality white light.” Lys, pg. 83. As shown in Fig. 25a, Lys describes the use of two PWM signals to control the lighting unit. The first signal, current control mode 2502, adjusts the wavelength of light emitted by the semiconductor, and the second is an on-off control 2504 used to

control the output intensity of the semiconductor. Petitioner proposes a combination where two PWM signals (as per Lys) would comprise the input to current sources 40, 41, and 42 described by Grootes. However, this would obviate the benefit of Lys (i.e., improved quality of white light via PWM wavelength control signal 2502). Grootes' current source only adjusts the brightness of each string, "[i]n a backlight, the white point is controlled by the balance of the R, G, and B intensities." Grootes, ¶42. Thus, the current control mode 2502 illustrated in fig. 25a would not adjust the current across the LEDs thereby adjusting the wavelength. This combination would abandon the key inventive feature of Lys. *See Intel Corp. v. Qualcomm Inc.*, 21 F.4th 784 (Fed. Cir. 2021) (affirmed that the Board correctly "weighed the competing evidence regarding the relevant tradeoffs and concluded, based on the stated importance of low impedance as 'key' to Valla, that negating this benefit during 'the majority of the operation' would have outweighed any reason to combine"); Petitioner offers no further example or explanation for why a POSITA would modify the current source in Grootes to input two PWM signals or how a POSITA would modify the current source of Grootes so as to maintain the inventive concept of Lys.

Petitioner does not explain how the combination of Grootes and Lys would yield a predictable solution or result. Petitioner offers no reason why a POSITA would understand that two PWM signals sent to the current sources of Grootes would predictably result in improved color and brightness uniformity. The current

sources in Grootes accept one PWM signal to adjust LED brightness. Lys supplies two separate PWM signals, both with different functions, one to adjust brightness via on-off control and a second to adjust the current supplied to the LEDs to adjust LED wavelength. A POSITA would not find that sending two different PWM signals to the cathode side of an LED or to the gate of a transistor offers a predictable solution to the problem of improving color and brightness control in LED systems.

B. The Combination of Lys and Grootes is not Invalidating.

Contrary to Petitioner's arguments, PO submits that Lys does not disclose the PWM controller and current supply circuit system taught in the '331 Patent. Petitioner's arguments ignore the fact that claim 17 describes a PWM controller which generates PWM control signals for the current supply circuits. Petitioner stated, "In other words, what determines whether a controller is a PWM controller or not is the output side of the controller, not the input side of the controller. Thus, PO's argument focuses on the wrong side (the input side) of the controller in attempting to distinguish Lys." (See, Paper 15 at 14). Petitioner misunderstand PO's position. PO's focus is that Lys only discloses PWM signals being transmitted in one orientation (See, Paper 12 at 19), from the controller 3600 to an LED. Lys makes no disclosure that the converter 1908 or power facility 1800 receive PWM signals, which would then be transmitted to the lighting unit 102 (Additionally see, POR at 23-24). Petitioner's position is that converter 1908 or power facility 1800 are

equivalent to the current supply circuits, and that controller 3600 is equivalent to the PWM controller. The '331 Patent, however, requires the PWM controller to generate PWM control signals for the current supply circuits. Petitioner does not provide a compelling reason for why the controller in Lys would send a PWM to the PFC/DC-DC element or power facility 1800, or why a POSITA would modify Lys to include this embodiment. Thus, Lys does not disclose all the limitations of claim 17C.

Petitioner again misquotes Lys by stating that the controller “can be used to control ‘multiple such strings.’” The correct disclosure by Lys is that “a microprocessor to control one or more LEDs in a string. Multiple such strings can be used to create a light fixture...” Lys is clear that a single microprocessor controls one or more LEDs in a single string, and that a light fixture can comprise multiple strings each controlled by an individual controller. Also, Petitioner doesn't offer a factual basis for why a POSITA would want to modify the controller in Lys to manage multiple strings. Additionally, Grootes only discloses a single PWM controller. As stated above, a POSITA wouldn't be motivated to combine the two references, but even if combined the references would not disclose a single controller connected to multiple strings.

III. GROUND 2 - LYS, GROOTES, AND XU**A. A POSITA Would Not be Motivated to Combine Lys, Grootes, and Xu.**

Similar to the motivation to combine argument with respect to Ground 1, Petitioner argues that PO “[focuses] on arguments related to whether one would bodily incorporate Xu’s disclosures with Lys-Grootes.” (See, Paper 15 at 16). However, Patent Owner presented the motivation to combine arguments below (See, Paper 12 at 30-34) , which Petitioner did not provide respond to and are not directed to the physical combination of the prior art references or whether a POSITA had the capability of combining them, but the fact that Petitioner has not recited a proper motivation for why a POSITA would combine Xu with Lys-Grootes.

The crux of Petitioner’s argument is that a POSITA would include the constant-on current and the sense resistor of Xu to achieve improved color and brightness uniformity as compared to Grootes and Lys. (Petition, 29-30, Ex. 1003 at paragraphs 93-99, Paper 15 at 17). The only evidence Petitioner offers is that the circuit in Xu allows for the LED to turn on to allow a fixed current and that the sense resistor generates a feedback signal allowing for a constant color temperature, which would improve the color and brightness uniformity of Lys-Grootes. Petitioner does not explain how a POSITA would understand that the fixed current in Xu would improve the color and brightness uniformity of Lys-Grootes. Petitioner does not explain how Xu’s circuit resulting in constant current improves the functioning of

the Lys-Grootes combination. KSR, 550 U.S. at 421 (“When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp.”).

Petitioner relied on hindsight to combine known elements in a way that fit the claims of the ‘331, rather than offering factual support for why a POSITA, when confronted with the problem of color and brightness uniformity, would combine them in the manner claimed. *In re Gorman*, 933 F.2d 982, 987 (Fed. Cir. 1991) (“It is impermissible to use the claimed invention as an instruction manual or ‘template’ to piece together the teachings of the prior art so that the claimed invention is rendered obvious”).

Contrary to Petitioner’s assertions, implementing the LED driving circuit of Xu into Lys-Grootes would undermine the key inventive features of both Lys and Grootes independently and the proposed combination and a POSITA would understand that the negative impact would have outweighed any motivation to combine. *Polaris Indus. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1061, 1067-69 (Fed. Cir. 2018) (vacating Board decision that failed to consider whether modifying prior art references would undermine its goal, shared with the challenged claims, of constructing stable all-terrain vehicles). Lys explains the key inventive feature of LED wavelength adjustment via a change in current supplied to the LED in order to

produce “improved quality white light.” Lys at pg. 83). Grootes’ key inventive feature is related to the current source adjusting the brightness of each string via a change in a PWM signal input into a transistor, “[i]n a backlight, the white point is controlled by the balance of the R, G, and B intensities.” (Grootes, ¶ 42). Petitioner further argues that the key benefit of Grootes when combined with Lys would be to “independently ‘control... the brightness of each LED’”. Petition, pg. 18. Thus, both Lys and Grootes describe the importance of adjusting current or a PWM signal to allow for better color and brightness uniformity. Petitioner then argues that a POSITA would be motivated to depart from this disclosure and implement a reference that pertains to constant current control in order to improve color and brightness and uniformity.

For Ground 1, Petitioner emphasizes the improvement caused by changing the current, and now Petitioner is stating that improved brightness and color uniformity is the result of a constant current methodology without addressing or acknowledging the differences between the two different circuit designs/implementations. The implementation of the constant current circuit described by Xu would abandon the key inventive features of Lys and Grootes independently and when combined. Petitioner offers no further example or explanation for why a POSITA would modify the Lys-Grootes combination to remove the transistor coupled to the PWM controller, why a POSITA would want to send two PWM signals into the circuit of

Xu, or how a POSITA would modify the circuit of Xu so as to maintain the inventive concept of Lys and Grootes.

Petitioner does not explain how the combination of Xu, Grootes and Lys would yield a predictable solution or result. It is not clear why a POSITA would understand that when two PWM signals are sent to the switch of Xu the result would be a predictable improvement in color and brightness uniformity. As stated above, Xu's circuit inputs one PWM signal. Lys supplies two separate PWM signals, both with different functions, one to adjust brightness via on-off control and a second to adjust the current supplied to the LEDs to adjust LED wavelength. A POSITA would not find that sending two different PWM signals into the circuit of Xu offers a predictable solution to the problem of improving color and brightness control in LED systems.

In summary, numerous reasons exist why a POSITA would not combine Xu with Lys and Grootes and these reasons are completely ignored by Petitioner.

B. Dependent Claim 18

i. There is no motivation to combine.

Claim 18 states:

“The lighting system according to claim 17,

wherein each of the first and second current supply circuits comprises a variable voltage boost, constant current power supply circuit configured to operate in continuous current mode.

'331 Patent, claim 18.

“The current supply circuit may act as a voltage boost converter to provide the high voltage that may be required to drive and LED string 24... Furthermore, the constant current may be supplied with a variable voltage boost to account for differences in average forward voltage from string to string.”

Id., 12:59-65.

The PFC/DC to DC converter 1908 of Lys reduces the high AC voltage to suitable level for the lighting unit 102. The PFC/DC to DC converter 1908 does not require a boost converter, as it does not need a voltage boost nor be constant with PFC. EX2001, ¶ 80. A POSITA would not combine the boost converter of Xu with the high voltage PFC/DC to DC converter of Lys, as it would likely destroy the lighting unit 102. *Id.* Xu, Lys, and Grootes in combination or separately do not disclose a current supply circuit comprising a variable voltage boost, constant current power supply circuit configured to operate in constant current mode.

Petitioner improperly equated the PWM controller of Lys to the “current supply circuits” of the '331 Patent (this is a contradiction to its position on Claim 17B). Petitioner offer no explanation how a POSITA would find that the circuit in Xu would improve control of the light output, especially the constant color temperature. Xu pertains to a LC (Inductor and Capacitor) or similar circuit that allows the LED to be quickly extinguished or lit. Xu does not describe adjusting the current or PWM

to change brightness, or how a constant current allows for greater control of the light output. Thus, no motivation exists here.

ii. Lys, Grootes and Xu Do Not Teach Claim 18.

Petitioner states that “Lys describes multiple color LEDs driven by PWM and that the power supply may supply ‘a substantially constant current.’” Petition, at 31-32. However, this is a misrepresentation of Lys and contradicts Petitioner’s prior position in Claim 17C. First, Petitioner has conflated the PWM controller and the current supply circuit in its argument. Lys states only that the PWM supplies a constant current to LED (*e.g.*, “Pulse width modulation (PWM) involves supplying a substantially constant current to the LEDs for particular periods of time”), not that the power supply does so in combination with the PWM. Lys, ¶ 35. Petitioner fails to explain which element in Lys corresponds to the “power supply” in its arguments for this element. However, based on Petitioner’s arguments for Claim 17C, it may be assumed that Petitioner intended the power supply would be represented by the PFC/DC to DC converter 1908. In that regard, Petitioner has not provided any evidence that the PFC/DC to DC converter is a constant current power supply circuit. Further, the PFC/DC to DC converter does not use a PWM signal, nor does it supply a PWM signal to the LEDs. Therefore, Lys does not disclose that the power supply is a constant current power supply. Further, as previously noted, a PFC/DC to DC converter is not equivalent to the current supply circuit.

Petitioner has not provided any reasoning as to how Xu would be combined with Grootes. As described above (see motivation to combine arguments), Xu and Grootes are incompatible, since adding a boost converter as taught by Xu to the cathode of the LED string in Grootes would interfere with the voltage power supplies and circuitry in Grootes. The resulting system would be non-operational. Additionally, Grootes already discloses a “constant current source.” Grootes, ¶ 61. A POSITA would not see any benefit or improvement to Grootes by adding a variable voltage boost or constant current power supply. Lastly, Grootes does not teach that its current supply sources comprise a “variable voltage boost” as required by the '331 Patent. Thus, neither Grootes, nor the combination of Xu and Grootes satisfies all elements of Claim 18. Petitioner has not presented any arguments to refute the foregoing.

C. Dependent Claim 19

Claim 19 requires that each of the first and second current supply circuits comprises a temperature sensor configured to generate a sensor output signal that the PWM controller uses to generate the first PWM signal or the second PWM signal. Petitioner has continuously alleged that the converter 1908 or power facility 1800 are equivalent to the current supply circuits of the '331 Patent. Petitioner then offers the confusing argument that “the temperature sensor and sense resistor could be implemented in conjunction with the DC-DC converter and that there are no

technical obstacles to doing so.” (Paper 15 at 18). Yet, the standard isn’t whether there is a technical obstacle, but if a POSITA would be motivated to modify the DC-DC converter to include a temperature sensor that outputs signals to the PWM controller. Petitioner has not offered convincing evidence that a POSITA would implement a temperature sensor in the power facility 1800 or converter 1908. Petitioner simply says that a temperature sensor can be used in conjunction with the DC-DC converter with no further supporting evidence as to why a POSITA would make that modification. Importantly, Lys does not disclose a temperature sensor in the DC-DC converter or power facility 1800 that is used to send outputs to the PWM controller. A POSITA would view the power facility in Lys as being tasked with power conversion and delivery. These circuits often comprise high voltage components, all of which would impact the temperature of any sensor or thermostat. Thus, a POSITA would view the interference as a reason to not make the proposed modification.

D. Dependent Claim 20

Petitioner admits that Xu only describes one feedback loop. Xu does not describe a sense resistor coupled to the output of a current control supply, but a sense resistor coupled to the cathode side of the LEDs. As such, none of the references cited by Petitioner discloses or teaches the elements of claim 20. Petitioner has not

sufficiently shown that a POSITA would make the modifications necessary to make the invention of Claim 20.

E. Dependent Claim 23

See discussion above regarding claim 17.

F. Dependent Claim 25

See discussion above regarding claim 17.

IV. GROUND 3 - PETITIONER'S COMBINATION OF LYS, GROOTES, XU, AND BLUM FAIL TO RENDER OBVIOUS DEPENDENT CLAIM 21.

A. Dependent Claim 21 is not Rendered Obvious.

Since Lys and Grootes do not render claim 17 obvious, claims 21 is not rendered obvious under Ground 3.

V. PATENT OWNER'S EXPERT'S OPINIONS ARE ENTITLED TO WEIGHT

Patent Owner's expert has provided detailed declarations and stood for a deposition in this matter. Petitioner seeks his exclusion merely because his opinions expose the fact that Petitioner's arguments are unsupported. They are also based on improper combinations of prior art that is simply unsuitable for combination as argued by Petitioner.

Petitioner complains of Patent Owner's expert declaration "parroting" the Response. However, Petitioner's expert declaration parrots the Petition in this matter, as shown below:

Petition (Paper 1)	Expert Declaration (EX. 1003)
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Pgs. 18-19	Paragraph. 89
Pg. 19	Paragraph. 90
Pgs. 19-20	Paragraph. 91
Pgs. 28-29	Paragraph. 93
Pg. 29	Paragraph. 94
Pg. 29-30	Paragraph. 95

Patent Owner's expert's opinions are well reasoned and entitled to weight.

VI. CONCLUSION

The Board should affirm the validity of the claims for the reasons above.

Respectfully submitted,

/s/ Neal Massand
Neal Massand

Counsel for Patent Owner

CERTIFICATE OF COMPLIANCE

Per 37 C.F.R. §42.24(a) and (d), the undersigned hereby certifies that the Petition complies with the type-volume limitation of 37 C.F.R. §42.24(a)(i) because, exclusive of exempted portions, it contains 3905 words as counted by the word-processing program used to prepare it.

Dated: November 4, 2024

Respectfully submitted,

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.6(e), the undersigned certifies that the above-captioned Mandatory Notice was served on counsel of record for the Petitioner by filing this document through the Patent Review Processing System as well as by delivering a copy via electronic mail to:

MFerrario@kilpatricktownsend.com (Lead Counsel)
MMorlock@kilpatricktownsend.com (Back-Up Counsel)

Dated: November 4 2024

/s/ Neal Massand
Neal Massand (Reg. No. 54,296)